Chronic Pain Experience on Depression and Physical Disability.

The importance of Acceptance and Mindfulness-based processes in a sample with Rheumatoid Arthritis.

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**Abstract**

The mediating effect of acceptance and mindfulness in the relationship between pain, depression and physical disability was examined in 55 Rheumatoid Arthritis (RA) patients. Results showed that the relationship between pain and depression was mediated by both nonreact and acceptance. By contrast, the relationship between pain and physical disability was mediated by acceptance but not by nonreact. This study provides evidences that the influence of these processes is different on depression and on physical disability. These findings support models that take both general measures of mindfulness and content-specific measures of acceptance into account when conceptualizing RA. Theoretical and clinical implications are discussed.

*Keywords:* pain experience, physical disability, mindfulness, acceptance, depression.

1. **Introduction**

Rheumatoid Arthritis (RA) is a distressing condition characterized by pain and swelling not only determined by inflammatory mechanisms but also by tissue damage (Fitzcharles, DaCosta, Ware & Shir, 2009). The association between the experience of pain and depression has been consistently reported in literature, with prevalence studies finding between 13 to 20 percent of comorbidity between these conditions (Goldenberg, 2010). There is an emerging consensus that patients with RA with more severe and frequent pain have two to three times higher risk of developing depression (Dickens, McGowan & Clark-Carter & Creed, 2002). Several studies have also shown that depressed RA patients exhibit higher levels of physical disability, with studies suggesting that RA patients who are depressed have poor outcomes, even when illness severity is accounted for (Goldenber, 2010).

It is now well established that psychological factors influence the relationship between pain and the outcomes (e.g. physical disability, depression) (Costa & Pinto-Gouveia, 2011; Gillanders, Ferreira, Bose & Esrich, 2013). However, research that sheds light on the possible contribution of buffering factors in the relationship between these variables is still in its early stages, with factors such as catastrophizing (Costa, Pinto-Gouveia & Marôco, 2014; Jensen, 2011), hopelessness, helplessness, perceived control (Morley & Keefe, 2007) and social support (Costa & Pinto-Gouveia, 2013; Pennix, Tilburg, Deeg, Kriegsman, Broeke & Van Eijk, 1997) being the most studied.

In spite of the encouraging effects of psychological factors (e.g., Turk, Swanson & Tunks, 2008), the variability of the outcomes, the magnitude and maintenance of its effects are still points of current discussion (Evers, Kraimaat, van Riel & Jong, 2002; Vowles, Wetherell & Sorrell, 2009).

For approximately three decades, psychological approaches to chronic pain were based on cognitive change (emotional and cognitive control) as the primary process (Flor & Turk, 1988; Turk & Monarch, 2002; Hoffman, Papas, Chatkoff & Kerns, 2007, for a review; Moorley, Eccleston & Williams, 1999). More recent developments within this framework give rise to more process-oriented approaches that normalize human suffering (Vowles et al., 2009). More than promote the emotional or cognitive control of the unwanted experience, these approaches highlight a change of the function or context of it. These process-oriented approaches promote an acceptance of psychological experience and a commitment to engage in meaningful activities, regardless of it content (Veehof, Oskam, Schreurs & Bohlmeijer, 2011). As such, this change of the function or context (e.g., the relation that individuals have with these unwanted experience) enables individuals to act more effectively and promotes a broader repertoire of response to deal with the unwanted and painful experience (Baer, 2010; Dahl, Wilson, Luciano & Hayes, 2005; McCracken, 2005; Viane, Crombez, Eccleston, Poppe, Devulder, Van Houdenhove & De Corte, 2004).

Acceptance has been defined within this perspective as “the willingness to experience continuing pain with no need to reduce, avoid, or otherwise change it” (McCracken, 1999). Acceptance has been put forward as a key mediator process between pain experiences and several outcomes such as depression and physical disability (Evers, Kraaimaat, van Lankveld, Jongen, Jacobs & Bijlsma, 2001; McCracken, 2005; McCracken, Carson, Eccleston & Keefe, 2004; Pinto-Gouveia, Costa & Marôco, 2015). Also, acceptance remains a significant predictor of functioning regardless of severity of pain (McCracken, 1998; McCracken & Eccleston, 2005; Viane, Crombez, Eccleston, Poppe, Devulder, Van Houdenhove, De Corte 2003). Acceptance also appears as a key process involved in treatment gains (McCracken, Vowles & Eccleston, 2005), decreasing the adverse effect of pain flares on emotional functioning (Kratz, Davis & Zautra, 2007).

Recently, mindfulness has also been stated as a key mediator between pain experiences and the outcomes (Hofmann, Sawyer, Witt & Oh, 2010; McCracken, Gautlett-Gilbert & Vowles, 2007; Song, Lu, Chen, Geng & Wang, 2014; Stephon, Salmon, Weissbecker, Ulmer, Floyd, Hoover & Studts, 2007). Mindfulness can be defined as an act of “paying attention in a particular way: on purpose, in the present-moment, and nonjudgmentally” (Brown & Ryan, 2003; Kabat-Zinn, 1994; McCracken, 2011). Despite being a less studied topic within chronic medical conditions, the relationship between mindfulness and both psychological and physical functioning is known for long (Kabat-Zinn, Lipworth & Burney, 1985; Gu, Strauss, Bond & Cavanagh, 2015, for a review; McCracken, Gauntlett-Gilbert & Vowles, 2007; Sephton et al., 2007). The effectiveness of mindfulness-based processes for medical conditions with chronic pain has been shown in symptom reduction and in the improvement of emotional functioning as well (Baer, 2003; Grossman, Niemann, Scmidt & Walach, 2004; Song et al., 2014, for a review). Furthermore, there is already some research that identifies the influence of some component of mindfulness on health and psychological functioning (Baer, Smith, Hopkins, Krietmemeyer & Toney, 2006; Baer & Peters, 2011). It is also well established in literature that some facets of mindfulness are more related to a formal practice than others. Signiﬁcant relationships with meditation experience in long-term meditation practitioners also have been documented (Baer, Smith, Lykins, Button, Krietemeyer, Sauer et al., 2007). Mindfulness and psychological well-being in experienced mediators, but changes in these facets of mindfulness over the course of a mindfulness-based program in a clinical setting have not been investigated. Thus mindfulness practice seems promotes the individuals’ ability to observe mindfully both internal and external experiences and to act with awareness, rather than behave in an “autopilot” mode and the ability to not react immediately to an inner experience (Baer et al., 2006). However, this question requires methods to assess levels of mindfulness to determine whether individuals engaged in the practice of mindfulness are in fact becoming more mindful over time, and if so, whether these increases are responsible for the positive outcomes observed (Carmody & Baer, 2008).

Besides the evidences about the association between acceptance-based and mindfulness-based approaches in the decrease of sick leave (Dahl, Wilson & Nilson, 2004), health care utilization, medication use and also in the promotion of emotional and physical functioning (McCracken, Eccleston & Bell, 2005; McCracken, Mackichan & Eccleston, 2007; Sephton et al., 2007), recent literature have highlighted the need to establish a unified theoretical model (McCracken & Vowles, 2014, pg 178). The emergence of such effective combined models could be done by looking behind the processes not searching for better facts or methods, but for the underlying philosophies and theories that guide individual´s behavior (McCracken & Vowles, 2014). Very few studies have included both general and contend specific measures of mindfulness and acceptance in this framework, despite evidences suggesting that both may be important in cultivating the overall well-being in people with chronic pain conditions, as they are predictors of disability and distress (McCracken & Keogh, 2009).

As such, this study examined the associations between pain experience, physical disability and depression with acceptance and mindfulness. We also investigate the possible mediating effect of acceptance and mindfulness in the relationship between pain experience, depression and physical disability. As in prior research, pain experience was expected to directly correlate with physical disability and depression such that, individuals with high severity of pain would report high physical disability and depression. In regard to the relationship between pain experience, mindfulness and acceptance, it was expected that low levels of pain would be associated with high levels of acceptances and mindfulness (nonreact). In regard the relationship between acceptance, mindfulness and the outcomes, it would be expected that individuals who scored higher on acceptance and mindfulness would reported low physical disability and depression. Finally, regarding the mediation model, both acceptance and mindfulness (nonreact) are expected to be mediators of the relation between pain experience and the outcomes.

**2. Method**

**2.1. Design**

In a cross-sectional design, attendees at three National Health Services and a Specialized Service were recruited. They were given questionnaire packages that contained information sheets, consent forms and self-report questionnaires designed to measure pain, physical disability, acceptance, mindfulness and depression. Ethical approval for the study was obtained from the Ethics Committee of both ACES-Oeste Sul and Instituto Português de Reumatologia.

**2.2. Inclusion and exclusion criteria**

Patients were eligible to participate if they were aged 18 years or over and had a primary diagnosis of Rheumatoid Arthritis (RA) for 2 years or less, according to the American College of Rheumatology/ **European League Against Rheumatism** criteria (Aletaha, Neogi, Silman, Funovits, Felson, Bingham III et al., 2010) (e.g. swelling of a metacarpophalangeal joint, swelling of a proximal interphalangeal joint, swelling of the wrist, tenderness of the hand, acute phase reaction and serological abnormalities). Which of these criteria have separate weights. Based on theoretical research, RA individuals with more than 2 years of disease progression were excluded as literature consistently showed that during the first years of disease, functional disability and deterioration are both established, with pain and physical disability being comparable to a long-time progression (Evers, Kraaimaat, Geenen, Jacobs & Bijlsma, 2003; Evers, Kraaimaat, Geenen & Bijlsma, 1998; Griffith & Carr, 2002; Newman, Fitzpatrick, Revenson, Skevington & Williams, 1996; Repping-Wuts, Utterhoeve, Riel & Achterberg, 2008) . Patients were excluded on the basis of having a malign or terminal condition (e.g. cancer). Other exclusion criteria were people with intellectual impairment (e.g., learning disability, Alzheimer´s dementia), severe mental illness, psychotic disorder and substance misuse problems. Patients were also excluded if they were currently involved in a psychological treatment intervention. These criteria were assessed by pain clinic consultants involved in the study.

## 2.3. Participants

Out of 68 patients invited, 62 initially consented to participate (response rate = 91.2 %). One was excluded due to the presence of a psychotic disorder and 6 due to the presence of a RA diagnosis for more than 2 years. Of a total of 55 participants, 44 were female (Mage= 55.93, *SD*= 17.84; M School attendance= 6.68, SD= 4.36) and 11 were male (Mage= 52.82, *SD*= 16.86; M School attendance= 6.18, SD= 3.03).

**2.4. Measures**

**2.4.1. Demographic questionnaire**

Demographic variables were assessed with a general checklist designed to this investigation and included questions about gender, age, marital status, profession and educational background.

**2.4.2. McGill Pain Questionnaire- Short Form (MPQ-SF: Melzack, 1987; Portuguese version by Melzack, 2005)**

The MPQ- SF is a 15-item adjective checklist rated on a 4-point intensity scale (from 0= None to 3= Severe) (i.e. sensory and affective dimensions) as well as two single-item measures (i.e. visual analogue numerical scale and pain intensity). The MPQ has both a total score and partial scores, where high scores mean higher levels of pain. For the purposes of this study only the adjective checklist was used. The internal consistency estimates for both sensory and affective dimensions were .78 and .76, respectively (Melzack, 1987). In the present study the internal consistency, Cronbach´s alpha was .78.

**2.4.3. The Arthritis Impact Measurement Scale 2 (AIMS2: Brandão, Zerbini & Ferraz, 1995; Portuguese version by Costa & Pinto-Gouveia, 2005)**

AIMS2 is a 78-item self-report scale that assesses health status in a multidimensional fashion using specific scales. The AIMS scales are scored in an inverse way, where low scores indicate better health status. The 9 original AIMS scales could be combined into 3 or 5 component models of health status. For the purpose of this study only the physical function was used, given it recognized value in the assessment

of the long-term outcomes. Functional disability in line with quality-of-life indices, are used to evaluate therapies and to assess the course of disease, being a prerequisite for proving that a drug has disease-controlling capacity (Salaffi, Stancati, Neri, Grassi, Bombardieri, 2005). In the present study the internal consistency, Cronbach´s alpha was .90.

**2.4.4. Chronic Pain Acceptance Questionnaire (CPAQ; McCracken, Vowles, & Eccleston, 2004; translation and adaptation: Costa & Pinto-Gouveia, 2009)**

CPAQ is a 20-item self-report questionnaire that is rated on a seven-point rating scale (from 0 = Never to 6 = Always) and measures the acceptance to chronic pain. The questionnaire comprises two subscales, pain willingness and activity engagement. This questionnaire has both a total score (range from 0 to 156) and partial scores (range from 0 to 54, for pain willingness; 0 and 66, for activity engagement), where higher scores mean high pain acceptance. Cronbach’s alpha was .82 and .78, for pain willingness and activity engagement, and the two scales showed to be correlated: r= .36 (McCraken et al., 2004). Correlations between psychopathology, self-compassion, experiential avoidance and rumination were observed (Costa & Pinto-Gouveia, 2009). Also the Portuguese version of this scale presented a Cronbach Alpha of .89 for activity engagement and.83 for pain willingness (Costa & Pinto-Gouveia, 2009). In the present study CPAQ showed high internal consistency (Cronbach´s alpha= .86).

**2.4.5. Five Facet Mindfulness Questionnaire (FFMQ: Baer, Smith, Hopkins, Krietmeyer & Toney, 2006; translation and adaptation: Gregório & Pinto-Gouveia, 2007)**

FFMQ is a 39-item self-report measure and 5 mindfulness skills: Observe (8 itens), Describe (8 itens), Act with awareness (8 itens); Nonjudge (8 itens) e, Nonreact (7 itens). A five-point (1. Never/Very rarely true; 5. Always/Almost always true) rating scale is used in each of the 39 items. Items 3, 5, 8, 10, 12, 13, 14, 16, 17, 18, 22, 23, 25, 28, 30, 34, 35 e 39 are recode. The measure gives partial scores, where higher results mean high mindfulness skills. Cronbach’s alpha ranged from .75 to .91 (Baer, Walsh, Lykins, 2009). Cronbach’s alpha of the Portuguese adaptation demonstrates acceptable values: .78, for Observe, .88 for Describe, .89 for Act with awareness, .86 for nonjudge, .66 for Nonreact (Gregório & Pinto-Gouveia, 2011). Validity was shown by positive associations between openness to experience, emotional intelligence and self-compassion. FFMQ also showed negative associations with alexithymia, dissociation, absent-mindedness, psychological symptoms, neuroticism, thought suppression, emotion regulation problems and experiential avoidance (Baer, Smith, Hopkins, Krietemeyer & Toney, 2006). For the purpose of this study only nonreact facet was used and showed a high internal consistency (Cronbach´s alpha= .81).

**2.4.5. The Depression, Anxiety and Stress Scales (DASS-42; Lovibond and Lovibond, 1995; Portuguese version by Pais-Ribeiro, Honrado, & Leal, 2004)**

DASS-42 is constituted by three subscales aimed at assessing levels of depression (e.g., “*I couldn’t seem to experience any positive feelings at all*”), anxiety (e.g., “*I was aware of dryness of my mouth*”), and stress (e.g., “*I found it difficult to relax*”). Each item is rated on a 4-point rating scale ranging from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much, or most of the time”). In the original version all subscales presented an adequate to good internal consistency with alpha´s values of .81 for depression, .73 for anxiety, and .81 for stress subscales. Similar values were found by Pais-Ribeiro et al. (2004), with the Portuguese version of the scale presenting internal consistency coefficients of 93. (depression), .83 (anxiety) and .88 (stress). In the current study only depression scale was used. In the present study the internal consistency, Cronbach´s alpha was .97.

## 2.5. Data analysis

Kolmogorov-Smirnov test and absolute values of Skewness and Kurtosis were used to assess data normality.

 Descriptive, preliminary and correlational analyses were performed using SPSS (V. 22; SPSS, An IBM Company, Chicago, IL). Pearson correlation analyses were performed to examine the associations between the facets of mindfulness, depression and physical disability. Pearson correlations were also performed to examine the associations between pain, physical disability, depression, mindfulness and acceptance.

The mediation analysis of emotional intelligence and acceptance in depression was performed using AMOS (V. 22; SPSS, An IBM Company, Chicago, IL). The presence of multivariate outliers was assessed with the squared Mahanalobis Distance (DM²). Pain was assumed to be the independent variable as measured by MPQ, physical disability and depression were assumed to be the dependent variable as measured by AIMS2 and DASS-42 and, both mindfulness (nonreact) and acceptance were assumed to be mediators as measured by FFMQ and CPAQ, respectively.

The indirect effects were analysed with Bootstrap resampling as described in Marôco (2014).

1. **Results**
	1. **Preliminary Analyses**

Based on Kolmogorov-Smirnov test, some variables had statistically significant deviation from the normal curve but a close inspection of the Skewness and Kurtosis showed that this deviation was not problematic for further inferential analysis (i.e. all within ]-0.5; 0.5[ interval) (Tabacnick & Fidell, 2007).

* 1. **Correlational analyses**
		1. **Facets of Mindfulness, Depression and Physical Disability**

Results showed a moderate and negative correlation between describe facet of mindfulness and depression (r= -.387; p< .01) with low levels of describe facet associated with higher levels of depression. Results also showed a moderate and negative correlation between nonreact facet of mindfulness and depression (r= -.408; p< .01) with low levels of nonreact facet associated with higher levels of depression.

* + 1. **Pain, Physical Disability and Depression**

Results showed a moderate and positive correlation between pain and depression (r= .304; p< .05) with high levels of pain associated with high levels of depression. Results also showed a high and positive correlation between pain and physical disability (r= .531; p≤ .001) with high levels of pain associated with high levels of physical disability.

* + 1. **Pain, Mindfulness (Nonreact) and Acceptance**

Results showed a moderate and negative correlation between pain and mindfulness (*r*= -.353; *p*< .05) with high levels of pain associated with lower levels of mindfulness (nonreact). Results also showed a moderate and negative correlation between pain and acceptance (r= -.468; p≤ .001) with high levels of pain associated with lower levels of acceptance.

* + 1. **Mindfulness (Nonreact), Acceptance and Depression**

Results showed that mindfulness (nonreact) and depression had a moderate and negative correlation (*r*= -.408; *p*> .05). Results also showed a high and negative correlation between acceptance and depression (*r*= -.572; *p*≤ .001), with high levels of acceptance associated with lower levels of depression.

* + 1. **Mindfulness (Nonreact), Acceptance and Physical Disability**

Results showed a moderate and negative correlation between acceptance and psychical disability (r= -.467; p≤ .001) with low levels of acceptance associated with higher levels of physical disability.

* 1. **Mediation analysis**

**The influence of Pain, Mindfulness (NonReact) and Acceptance on Physical Disability and Depression**

The mediation model of mindfulness (nonreact) and acceptance on physical disability and depression adjusted to 55 individuals of both genders is depicted in Figure 2. Based on p-values a path coefficient pain → depression was excluded (B= -.007; S.E.= .011; P= .971; β= -.05) and mindfulness (nonreact) → physical disability (B= -.001; S.E.= .011; P= .975; β= -.004) were excluded. The model showed a good fit to the variance-covariance structure (χ²(2)= .002, p= .999; χ²/df= .001; CFI= 1.000; TLI= 1.150; PCFI= .200; RMSEA= .000, P[rmsea≤ .05]= .999).

All predictors, as theorized by the model, explained 37% of depression and 35% of physical disability variability. Pain had a direct effect on physical disability (β= .396). Thus high levels of pain were associated to high levels of physical disability. Pain had also a mediate effect through acceptance (βAcceptance.Pain × βPhysicalDisability.Acceptance= -.468× -.290= .0136; p= .030; 95% C.I. ] .010; .337[). Results also showed that pain had two mediate effects on depression, one through acceptance (βDepression.Acceptance × βAcceptance.Pain= -.488× -.468= .228; P= .002; 95% C.I.= ] .105; .538[). This showed that depression increased by about .228 standard deviations for every increase in pain of a full standard deviation via its prior effect on acceptance. Pain had also another mediate effect on depression through mindfulness (nonreact) (βDepression.MindfulnessNonReact× βMindfulnesNonReact.Pain= -.224 × -.353= .079; P= .002; C.I. ] .105; .538[). This showed that depression increased by about .079 standard deviations for every increase in pain of a full standard deviation via its prior effect

Overall the model suggests that both acceptance and mindfulness (nonreact) are mediators of the relation between pain and depression but only acceptance is a mediator of the relation between pain and physical disability.

1. **Discussion**

The first step of the study confirmed that chronic pain experiences, depression, physical disability, acceptance and mindfulness were related in theoretically predictable ways. Like in previous research, our results showed that higher severity of pain was associated with more depression and physical disability (Dickens et al., 2002; Goldenberg, 2010).

Our results also confirmed moderate and negative associations between mindfulness and depression, specifically the mindfulness components related to describing and nonreacting. These findings are consistent with previous research that has shown the association between high abilities of mindfulness, lower report of symptoms and/or improvements in wellbeing, specifically the components of mindfulness related to “acting with awareness”, “nonjudging” and “nonreacting” (Baer, Smith, Hopkins, Krietemeyer & Toney, 2006). These results were also in line with previous evidences that showed the relationship between some components of mindfulness and psychological adjustment (Baer, Smith, Lykins, Button, Krietemeyer, Sauer, …,2008; Lykins & Baer, 2009).

In the context of chronic pain, the relationships between the mindfulness components related to describe and nonreact and, depressive symptoms address an interesting perspective since the use of language to label the internal experiences and the ability to let thoughts and feelings come and go, without becoming absorbed or entangled in them, are in fact more related with less symptoms. This is in line with some recent findings suggesting that the relationship between different facets of mindfulness and the symptoms of depression and anxiety depends on the capacity to observe nonreactively, which may influence symptoms directly and indirectly through cognitive emotion regulation strategies (Desrosiers, Vine, Curtiss & Klemanski, 2014; Raphiphatthana, Jose & Kielpikowski, 2016).

Further to that, our findings showed high and negative associations between acceptance and depression, and acceptance and physical disability, as previously reported in several studies (Evers et al., 2001; McCracken, 1998; McCracken, 2005; McCracken et al., 2004; McCracken, Vowles & Eccleston, 2005; Viane et al., 2003; Viane et al., 2004).

Secondly, we investigated the possible mediating effects of mindfulness (nonreact) and acceptance in the relationship between pain experiences, depression and physical disability. It is important to notice that the nonreact component of mindfulness was the only one involved in mediation analysis model, based on the results of previous correlation analysis performed. Even though this is the first time a study investigated the influence of each component of mindfulness in RA depression and physical disability, the results are not unsurprising since some research has shown the relationship of some components with mindfulness formal practice. Despite that, mindfulness is a practice but also a way of being in the world. As such, it can be simply bare awareness of whatever arises into consciousness moment by moment (Carlson, 2012).

Our tested model showed that both mindfulness (nonreact) and acceptance were significant mediators of the relationship between pain experiences and depression, accounting for 37% of the total variance. Results showed that pain did not have a direct effect on depression. As such, the use of both mindfulness and acceptance processes seems to buffer entirely this relation. Even though this is the first time a study investigated a general measure of mindfulness and a more specific measure of acceptance together in a single model with RA patients, our results are consistent with those from previous studies that have looked to these relationships within an contextual cognitive behavioral framework (Hayes, Villatte, Levin & Hildebrandt, 2011; McCracken & Vowles, 2006; Vowles, McNeil, Gross, McDaniel, Mouse, Bates et al., 2007).

Regarding the relationship between pain experiences and physical disability, only acceptance was found to be a significant mediator (35% of the variance score in physical disability accounted). Although previous research suggests the effect of mindfulness use on symptoms reduction (Baer et al., 2006), this was not confirmed in our model. Some hypotheses related to this result could be suggested: 1) the effect of mindfulness (nonreact) on physical disability is nonexistent or negligible; or, 2) most variance in physical disability is better represented by the mediator role of acceptance. The latter hypothesis would be unsurprising as several studies have shown a strong mediation effect of acceptance in the relation between pain experiences and physical disability (Gillanders, Ferreira, Bose & Esrich, 2013; McCracken, Vowles & Eccleston, 2005).

As a whole, our findings showed that in RA diagnosed patients, the influence of acceptance and mindfulness is different on depression and on physical disability. Specifically, results showed that both processes are more widely used when RA individuals deal with depression. Furthermore, mindfulness appears to be a less prominent process when RA patients deal with physical disability. It seems that they were not able to adopt a kindly curiosity to investigate unwanted experiences related with physical disability, without falling prey to automatic judgments or reactivity (Baer et al., 2006; Segal, Williams & Teasdale, 2002).

Even though acceptance and mindfulness are suited to help where chronic pain conditions have their most aversive impact, more research is needed to study the integration of both general and specific measures in a more standard outpatient clinical setting, where interventions are generally provided by a single discipline (Baer & Peters, 2011; McCracken, Vowles, Gregg & Almada, 2010; McCracken & Keogh, 2009; Vowles, Wetherell & Sorrell, 2009).

The understand of the potential benefits of these processes in physical medical conditions gives a different perspective to the illness experience itself (Carlson, 2012). Thus, the knowledge that the only certainty in life is change and that sometimes the best way to do to solve a problem is doing nothing, can promote a relieve. When the individuals with CP recognize that they can actually slow down and see things as they are, lthey also learn ways to hold with the strong emotions and sensations that arise. As such, the understanding that some unpleasant symptoms are tolerable and constantly in change can freedom CP individuals from suffering (Carlson, 2012).

Limitations of this study should also be considered. The cross-sectional design used in this study does not allow us to prove causation. However, the model tested was derived from a larger theoretical review. As literature previously mentioned, there might be a degree of overlap between key variables, mindfulness and acceptance. The presence of a disturbance correlation of .25 between both mediators supports the argument that they are closely related constructs. Further to that, some authors have suggested acceptance as an outcome of mindfulness practice or a stance that help in cultivating mindfulness. Others suggest acceptance as a component of mindfulness. Also relevant is the fact that most of the mindfulness measures assess attention to or awareness of present-moment experiences as well as acceptance, willingness, or non-avoidance. In contrast acceptance measures were developed with Acceptance and Commitment Therapy (ACT) which conceptualizes mindfulness and acceptance as a broader construct that included engaging in overt behavior consistent with valued goals (Baer & Peters, 2011).

Future research could include a more detailed longitudinal study with a larger sample of how individual processes, such as mindfulness and acceptance, shift throughout the course of illness. Although previous research has suggested both acceptance of pain and general mindfulness to be significant predictors of well-being in people with chronic pain (McCracken & Keogh (2009), additional efforts should be made to identify the individual contribution of each mindfulness component to physical and psychological functioning.

Both acceptance- based and mindfulness- based approaches differ in their theoretical perspective at a point besides their degree of overlap at the level of technique. As such, the use of self-report measures may be an inaccurate way of trying to separate them once a significant variance is shared.

Even with the above concerns in mind, this work does offer the opportunity to examine how acceptance and specific components of mindfulness operate in the relation between pain experiences and outcomes within a specific chronic medical condition, RA. It seems that RA patients that were more open to the experience of uncomfortable feelings, thoughts or sensations related to pain experience, experienced less physical disability and depression, being willing to live their life in a way consistent with valued goals.

In conclusion, this study has highlighted the potential importance and complexity of acceptance and mindfulness processes to pain experiences and the impact of pain general and specific-based measures on outcomes (e.g. depression and physical disability). Hopefully the current study will contribute to a wider discussion of how to best serve patients with chronic pain conditions by promoting a shift from seeking to understand the reality of the world to seeking ways to act successfully in the world besides unwanted bodily sensations and feelings (McCracken & Vowles, 2014).

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Figure 1. Final Model

